

# ABSTRACT OF THE DISCLOSURE

A fine carbon fiber having an outer diameter of about 1  
to about 80 nm and an aspect ratio of 10 to 30,000,  
comprising a hollow center portion and a multi-layer sheath  
5 structure of a plurality of carbon layers, the layers forming  
annual rings, wherein the sheath-forming carbon layers form  
an incomplete sheath, i.e., the carbon layers are partially  
broken or disrupted in a longitudinal direction, and the  
outer diameter of the carbon fiber and/or the diameter of the  
10 hollow center portion are not uniform in a longitudinal  
direction. The carbon fiber is obtained by instantaneously  
reacting a carrier gas at a high temperature and an organic  
compound gas kept at a temperature below the decomposition  
temperature of the transition metal compound and has a  
15 conductivity equivalent to that of a conventional vapor phase  
method and is useful as a filler material in resins, rubbers,  
paints and the like.